

# Service Manual

Radio

FM-AM-SW<sub>1~6</sub> 8-BAND  
PORTABLE RADIO

## RF-2200BS(A)



### ■ SPECIFICATIONS

|                         |                 |                             |                    |                                        |                        |
|-------------------------|-----------------|-----------------------------|--------------------|----------------------------------------|------------------------|
| Frequency Range:        | FM              | 87.5~108 MHz                | Power Output:      | SW <sub>5</sub>                        | 0.3μV for 50 mW Output |
|                         | MW              | 525~1610 kHz (571~186m)     |                    | SW <sub>6</sub>                        | 0.3μV for 50 mW Output |
| Intermediate Frequency: | SW <sub>1</sub> | 3.9~8 MHz (76.9~37.5m)      | Power Source:      | 3W (DC Max.)                           |                        |
|                         | SW <sub>2</sub> | 8~12 MHz (37.5~25m)         |                    | 2.4W (MPO)                             |                        |
|                         | SW <sub>3</sub> | 12~16 MHz (25~18.8m)        | Power Consumption: | AC 110—125/220—240V 50/60 Hz or        |                        |
|                         | SW <sub>4</sub> | 16~20 MHz (18.8~15m)        |                    | 6V (Four "D" Size Flashlight           |                        |
|                         | SW <sub>5</sub> | 20~24 MHz (15~12.5m)        |                    | Batteries)                             |                        |
|                         | SW <sub>6</sub> | 24~28 MHz (12.5~10.7m)      |                    | (Panasonic UM-1 or equivalent)         |                        |
| Sensitivity:            | FM              | 10.7 MHz                    | Speaker:           | 7W (AC Only)                           |                        |
|                         | MW & SW         | 2nd 455 kHz                 | Dimensions:        | 10 cm (4") PM Dynamic Speaker          |                        |
|                         | SW              | 1st 1.985 MHz               | Weight:            | 12 1/2" (Wide) × 7 1/2" (High) ×       |                        |
|                         | FM              | 2μV (S/N 6 dB)/50 mW Output |                    | 3 1/8" (Deep)                          |                        |
|                         | MW              | 14μV/m for 50 mW Output     | Impedance:         | (318 × 188 × 100 mm)                   |                        |
|                         | SW <sub>1</sub> | 0.5μV for 50 mW Output      |                    | 3 kg (6 lb. 9.8 oz.) without batteries |                        |
|                         | SW <sub>2</sub> | 0.5μV for 50 mW Output      |                    | Speaker                                | .....8Ω                |
|                         | SW <sub>3</sub> | 0.5μV for 50 mW Output      |                    | Earphone Jack                          | .....8Ω                |
|                         | SW <sub>4</sub> | 0.5μV for 50 mW Output      |                    | Recording Out Jack                     | .....3kΩ               |

Specifications are subject to change without notice for further improvement.

 **National Panasonic**

**Matsushita Electric Trading Co., Ltd.**  
P.O. Box 288, Central Osaka, Japan

## ■ TO REMOVE FRONT AND REAR COVER

1. Set dial scale to minimum frequency.
2. Remove the ten (10) knobs for the FM AFC, X-TAL MARKER, VOLUME, BASS, TREBLE, TUNING SPEED, BAND and MW/SW RF GAIN.
3. Lift up the gyro antenna.
4. Remove the battery cover and pull out the batteries.
5. Remove the six (6) screws for the cabinet cover, as shown in fig. 1.
6. Remove the rear cover.
7. Remove the sockets from chassis.
8. Push the catch in the direction of arrow, as shown in fig. 2 and remove the front cover.
9. Remove the sockets from chassis.
0. To reassemble, reverse the above procedure and note the following.
  1. Set power and AFC switch to "ON" position.
  2. Set X-TAL marker and BFO switch to "OFF" positions.

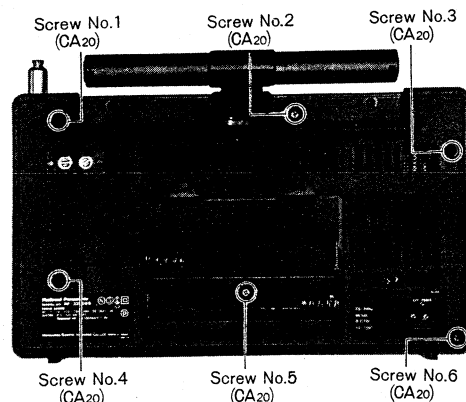


Fig. 1

## ■ TO REMOVE DIAL DRIVE ASSEMBLY

1. Set band switch to "SW-SW<sub>1</sub>" position.
2. Remove the cabinet covers. (Refer to cabinet cover removal instruction.)
3. Remove the four (4) screws (nos. 1~4) for the dial drive assembly, as shown in fig. 3.
4. Turn the tuning shaft to clockwise and set the two (2) screws at the position, as shown in fig. 4.
5. Loosen the one (1) screw (no. 2) for the variable capacitor shaft, as shown in fig. 4.
6. Turn tuning shaft fully counter-clockwise.
7. Loosen the one (1) screw (no. 1) for the variable capacitor shaft, as shown in fig. 4.
8. Remove the tuning knob.
9. Push the catch in the direction of arrow ① and remove the front panel in the direction of arrow ②, as shown in fig. 5.
10. Remove the six (6) screws (nos. 1~6) for the dial drive assembly, as shown in fig. 6.
11. Remove the dial drive assembly.
12. To reassemble, reverse the above procedure and note the following.
  1. Set the band switch shaft at the position (SW, SW<sub>1</sub>), as shown in fig. 7.
  2. Set the band switch shaft of dial drive assembly at the position, as shown in fig. 8.
  3. Set the "0" point of dial scale to pointer of front panel, as shown in fig. 8.
  4. Set tuning capacitor to maximum capacity.
  5. Insert the dial drive assembly in chassis.
  6. Turn the shaft of band selector drum with a pliers and set the indicator of band selector drum to "SW<sub>1</sub>" position, as shown in fig. 8.

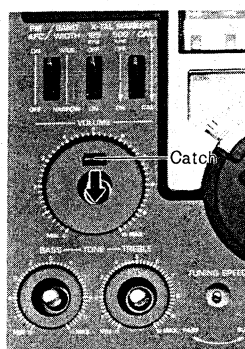


Fig. 2

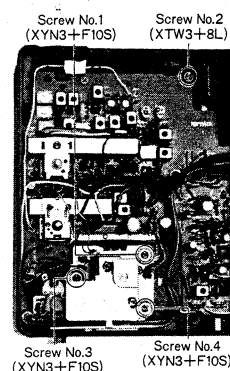


Fig. 3

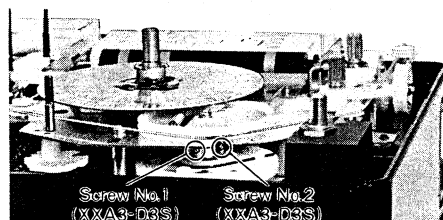


Fig. 4

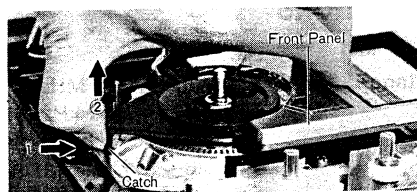


Fig. 5

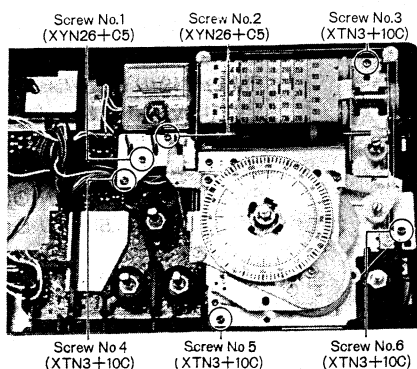


Fig. 6

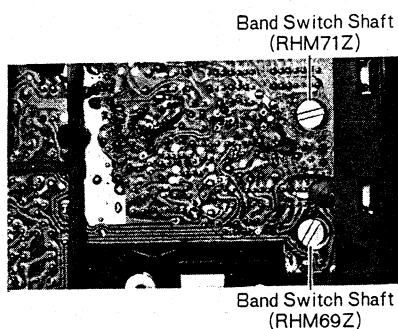


Fig. 7

## ■ DIAL CORD INSTALLATION GUIDE

1. Remove dial drive assembly. (Refer to dial drive assembly removal instruction.)
2. Remove spread dial.
3. Loosen the one (1) screw for the drum shaft, as shown in fig. 8.
4. Set the dial drum at the position, as shown in fig. 9.
5. Turn tuning shaft fully counter-clockwise.
6. Cord length is 100 cm (39 $\frac{3}{8}$ "').
7. Arrows (1~12) indicate correct order and direction of dial cord installation, as shown in fig. 9.
8. Cement dial cord ends.
9. Set the "0" point of dial scale to pointer of front panel. (Refer to dial scale mounting instruction.)

## ■ TO MOUNT DIAL SCALE

1. Remove the front cover. (Refer to cabinet cover removal instruction.)
2. Remove the front panel. (Refer to dial drive assembly removal instruction.)
3. Loosen the one (1) screw for the drum shaft, as shown in fig. 10.
4. When removed the rollers, set the roller no. 1 and 2 at the position, as shown in fig. 11.
5. Wind the dial scale onto roller no. 2 shown in fig. 10 and secure the gear of roller no. 2. Hook the dial scale on the catch of roller no. 1, as shown in fig. 10.
6. Mount the front panel to chassis.
7. Turn the tuning shaft fully counter-clockwise.
8. Turn the roller gear, shown in fig. 12 and set the "0" point of dial scale to the pointer of front panel, as shown in fig. 8. Tighten the one (1) screw for the drum shaft, as shown in fig. 8.

## ■ TO REMOVE POWER, LIGHT AND BFO SWITCH

1. Remove the cabinet covers. (Refer to cabinet cover removal instruction.)
2. Push the four (4) catches in the direction of arrow shown in fig. 13 and remove the switch.
3. To reassemble, reverse the above procedure.

## ■ TO REMOVE BASS, TREBLE, VOLUME AND RF GAIN CONTROL

1. Remove the cabinet covers. (Refer to cabinet cover removal instruction.)
2. Remove the dial drive assembly. (Refer to dial drive assembly removal instruction.)
3. Set variable capacitor to maximum capacity.
4. Unsolder the lead wire of RF gain control from chassis.
5. Remove the meter and dial lamp.
6. Remove the power, light and BFO switch. (Refer to switch removal instruction.)
7. Remove the FM AFC and X-TAL marker switch.
8. Remove the three (3) red screws (nos. 1~3) for the PC board, as shown in fig. 14.
9. Remove the two (2) screws (nos. 4 & 5) for the lead wires, as shown in fig. 14.
10. Remove the four (4) nuts (nos. 1, 3, 4 & 5) for the controls, as shown in fig. 15.
11. Remove the one (1) screw (no. 2) for sub PC board, shown in fig. 15 and remove sub PC board.
12. Push the eight (8) catches for the PC board, shown in fig. 15 and remove PC board.
13. Unsolder the controls, as shown in fig. 16.

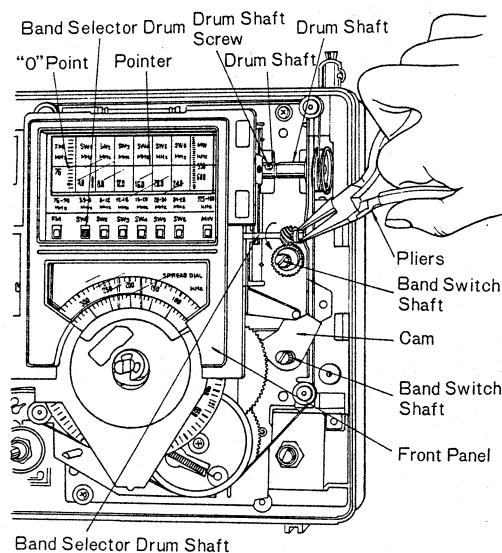


Fig. 8

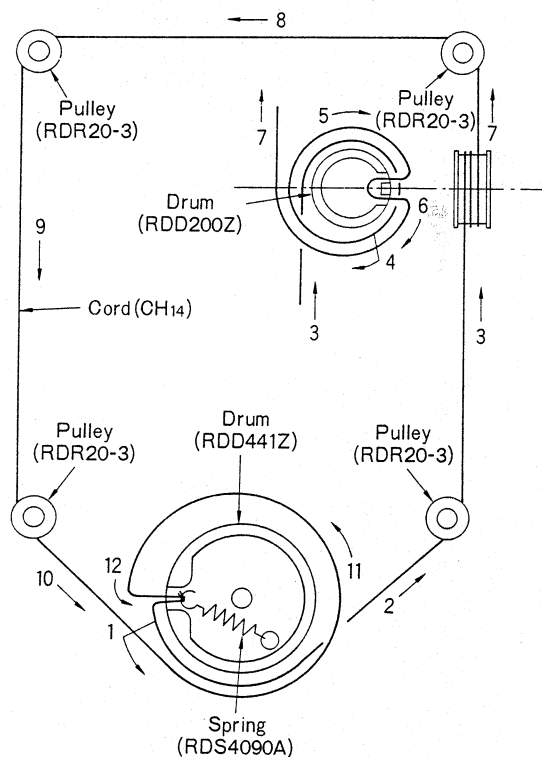


Fig. 9

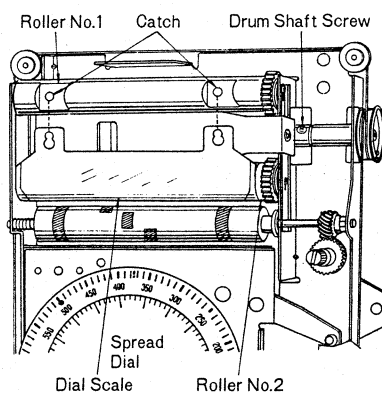


Fig. 10

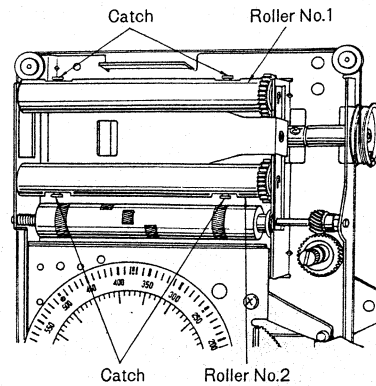


Fig. 11

## ■ TO REMOVE GYRO ANTENNA CASE ASSEMBLY

1. Remove the rear cover. (Refer to cabinet cover removal instruction.)
2. Unsolder the lead wire of gyro antenna from PC board.
3. Remove the circlip in the direction of arrow, as shown in fig. 17.
4. Remove the gyro antenna case.
5. To reassemble, reverse the above procedure.

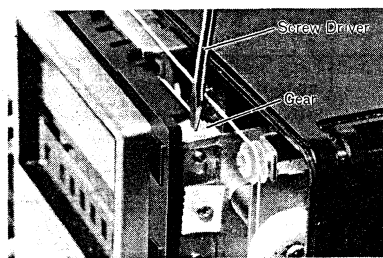


Fig. 12

## ■ TO REMOVE CORE ANTENNA

1. Remove the gyro antenna cover in the direction of arrow, as shown in fig. 18.
2. Unsolder lead wires from core antenna, as shown in fig. 19.
3. To reassemble, reverse the above procedure.

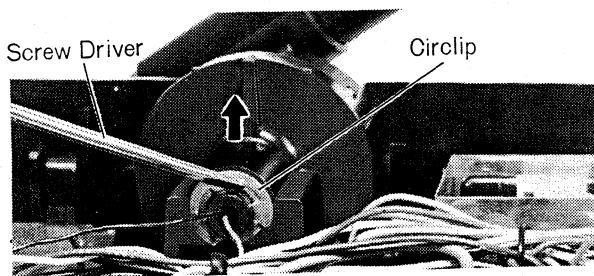


Fig. 17

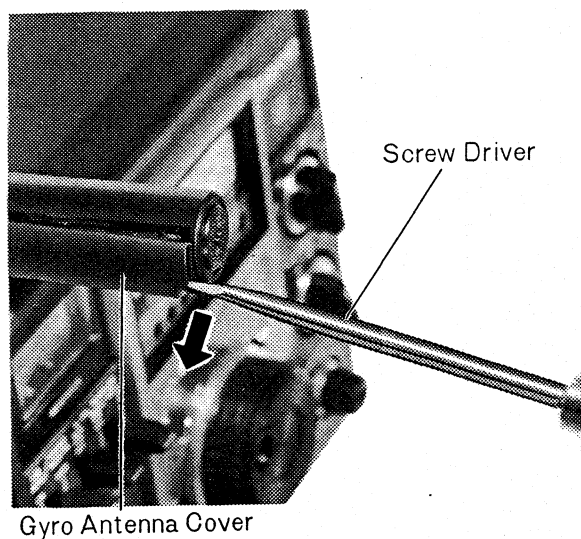


Fig. 18

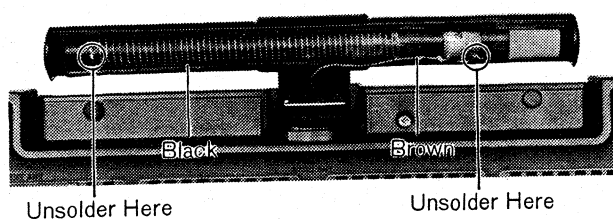


Fig. 19

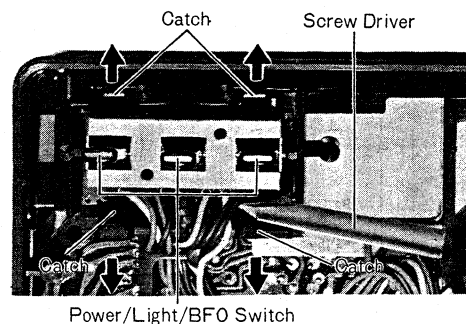


Fig. 13

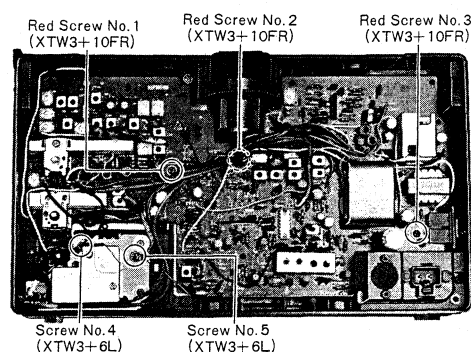


Fig. 14

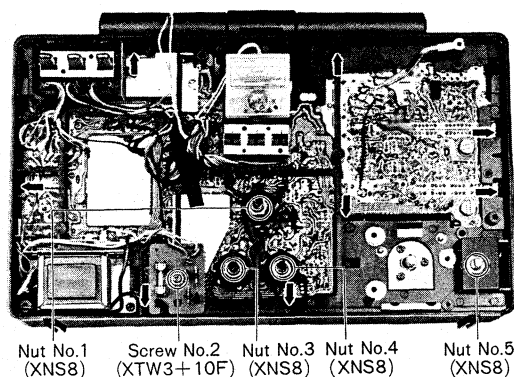


Fig. 15

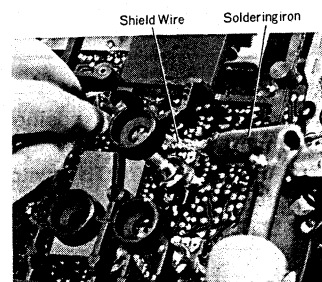
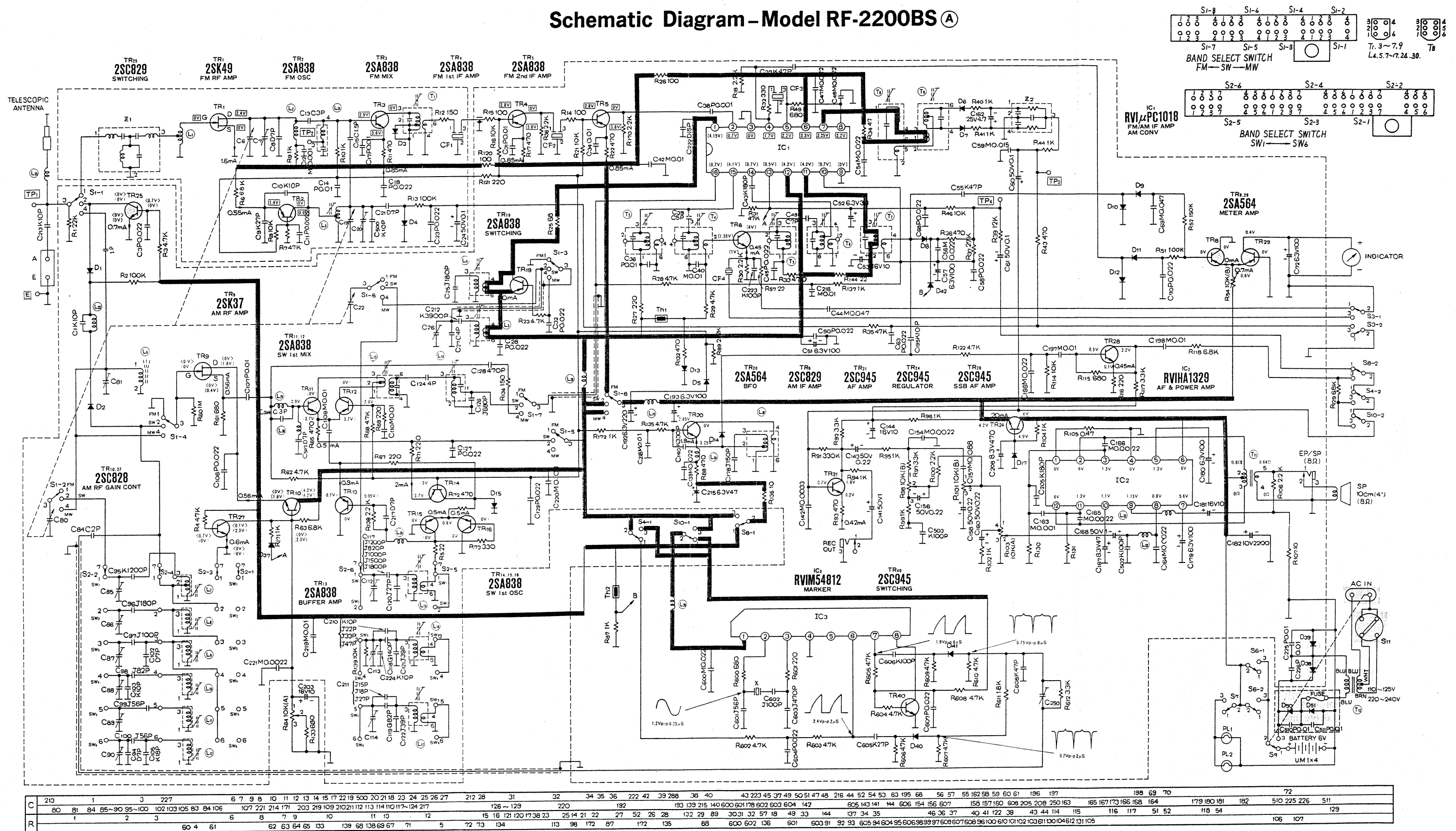


Fig. 16

# Schematic Diagram - Model RF-2200BS ①



## Notes:

- S1-1~S1-8: Band switch in "FM" position.
- S2-1~S2-6: SW band switch in "SW<sub>1</sub>" position.
- S3-1, S3-2: FM AFC/BAND WIDTH switch in "OFF", "NARROW" position.
- S4-1, S4-2: X-TAL MARKER/125 kHz switch in "OFF" position.
- S6-1, S6-2: Power switch in "OFF" position.
- S7: Dial Light switch in "OFF" position.
- S8-1, S8-2: BFO switch in "OFF" position.
- S9: AC-BATTERY switch in "BATTERY" position.
- S10-1, S10-2: X-TAL MARKER/500 kHz switch in "OFF" position.
- S11: Voltage selector in "110~125V" position.
- DC voltage measurements are taken with circuit tester 10kΩ/V from negative side of batteries.
- ...FM position [ ]...MW & SW position ( )...SW position < >...CAL-ON position TR20...BFO-ON position

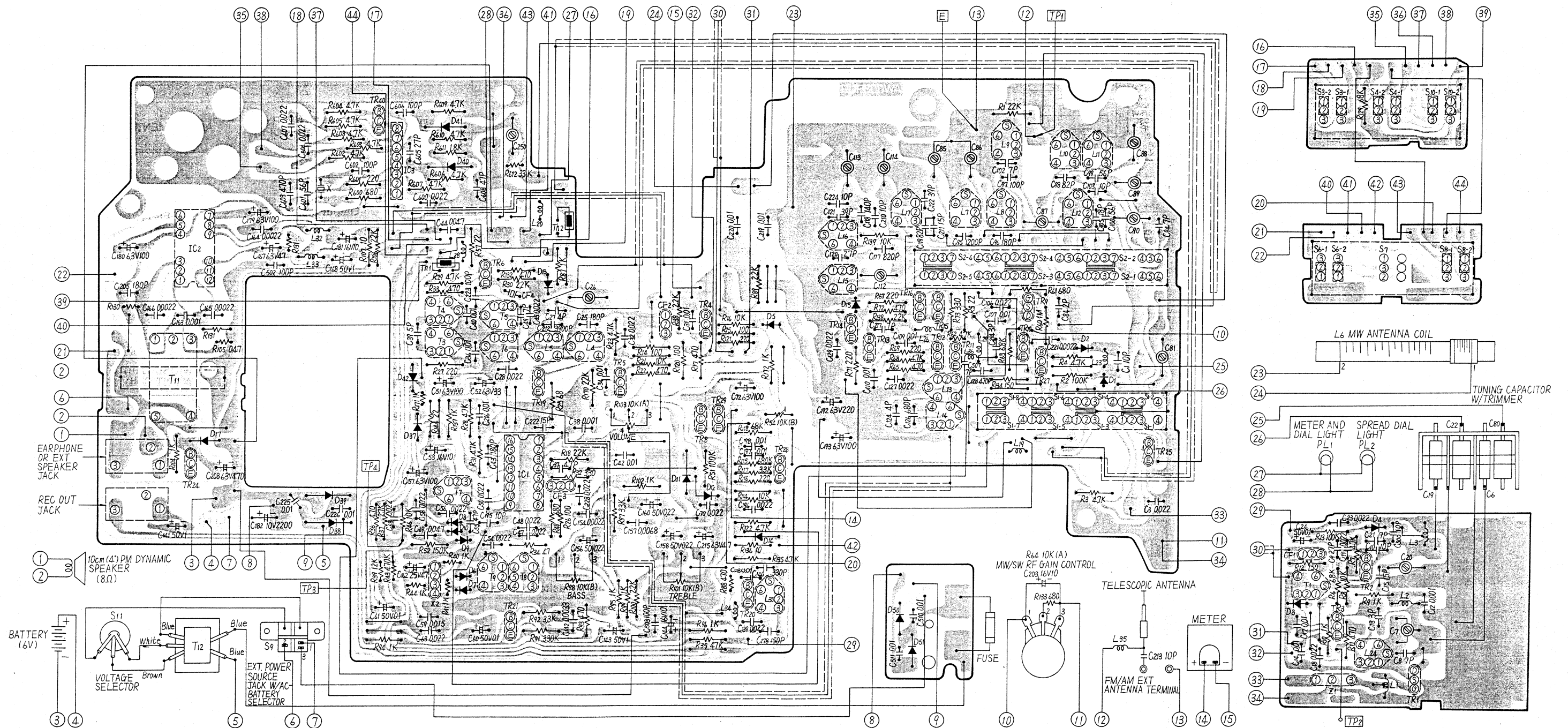
- IC<sub>2</sub> with B rank without R<sub>130</sub>, R<sub>131</sub>.
- IC<sub>2</sub> with C rank R<sub>130</sub>, R<sub>131</sub>.....22 kΩ.
- IC<sub>2</sub> with D rank R<sub>130</sub>, R<sub>131</sub>.....15 kΩ.
- Battery current: No signal ..... 60mA  
Maximum output .....650mA

## IMPORTANT SAFETY NOTICE

THE SHADED AREA ON THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR SAFETY. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURER'S SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SHADED AREAS OF THE SCHEMATIC.

|                   |            |               |                          |            |               |
|-------------------|------------|---------------|--------------------------|------------|---------------|
| D <sub>1,2</sub>  | RVDS113    | SWITCHING     | D <sub>11,12</sub>       | OA90       | FM METER RECT |
| D <sub>3</sub>    | RVD1K110   | FM AGC        | D <sub>14</sub>          | RVD1K110   | SSB DET       |
| D <sub>4</sub>    | RVDS113    | FM AFC        | D <sub>15</sub>          | RVDVD1252L | AOC           |
| D <sub>5,13</sub> | RVDVD1250M | AOC           | D <sub>17</sub>          | RVDMA205   | ZENER         |
| D <sub>6,7</sub>  | 2-OA90     | FM DET        | D <sub>37,42</sub>       | MA150      | SWITCHING     |
| D <sub>8</sub>    | OA90       | AM DET        | D <sub>38,39,50,51</sub> | RVD10E1LF  | RECT          |
| D <sub>9,10</sub> | OA90       | AM METER RECT | D <sub>40,41</sub>       | OA90       | MARKER        |

# Circuit Board Wiring View-Model RF-2200BS(A)



| TR, D & IC | TR24, D11, IC2 | D39, D38 | TR40, IC3, D42, D37, D8, D10, D9, D6, D7, D40, D41, TR6, TR21, IC1, TR19, D13 | TR5 | D11, D12, TR8, TR4, TR29, TR20, D44, D5, TR28 | TR14, D15, TR13 | TR16, TR15, TR12, TR11, D50, D51              | TR10, TR9, TR27, D2, D1 | D3, TR3, TR2, D4, TR1   |
|------------|----------------|----------|-------------------------------------------------------------------------------|-----|-----------------------------------------------|-----------------|-----------------------------------------------|-------------------------|-------------------------|
| T & L      | T11, T12       | L33, L32 | T4, T3, L28, T7, T5, T6, T9, T8, L5, L4                                       |     | L34, L30                                      | L16, L15        | L17, L26, L13, L14, L7, L36, L29, L8, L9, L19 | L10, L12, L11, L23, L35 | T1, L6, L24, L1, L2, L3 |

| TR1 |        |
|-----|--------|
| FM  |        |
| S   | 0 V    |
| G   | 0 V    |
| D   | 2.4 V  |
| Ic  | 1.6 mA |

| TR2 |         |
|-----|---------|
| FM  |         |
| C   | 0 V     |
| B   | 0.9 V   |
| E   | 1.4 V   |
| Ic  | 0.55 mA |

| TR3 |         |
|-----|---------|
| FM  |         |
| C   | 0 V     |
| B   | 2.9 V   |
| E   | 3.6 V   |
| Ic  | 0.85 mA |

| TR4 |         |
|-----|---------|
| FM  |         |
| C   | 0 V     |
| B   | 2.8 V   |
| E   | 3.8 V   |
| Ic  | 0.85 mA |

| TR5 |         |
|-----|---------|
| FM  |         |
| C   | 0 V     |
| B   | 2.8 V   |
| E   | 3.8 V   |
| Ic  | 0.85 mA |

| TR6     |         |
|---------|---------|
| MW & SW |         |
| C       | 4 V     |
| B       | 1.55 V  |
| E       | 1 V     |
| Ic      | 0.45 mA |

| TR8 |       |
|-----|-------|
| C   | 0 V   |
| B   | 0 V   |
| E   | 0.6 V |
| Ic  | 0 mA  |

| TR9     |         |
|---------|---------|
| MW & SW | CAL-ON  |
| S       | 0.4 V   |
| G       | 0 V     |
| D       | 1.8 V   |
| Ic      | 0.56 mA |

| TR10    |         |
|---------|---------|
| MW & SW | CAL-ON  |
| C       | 4.2 V   |
| B       | 2.3 V   |
| E       | 1.8 V   |
| Ic      | 0.55 mA |

| TR11 |        |
|------|--------|
| SW   |        |
| C    | 0 V    |
| B    | 2.9 V  |
| E    | 3.7 V  |
| Ic   | 0.5 mA |

| TR12 |        |
|------|--------|
| SW   |        |
| C    | 0 V    |
| B    | 2.9 V  |
| E    | 3.7 V  |
| Ic   | 0.5 mA |

| TR13 |        |
|------|--------|
| SW   |        |
| C    | 0 V    |
| B    | 0.05 V |
| E    | 0.7 V  |
| Ic   | 0.9 mA |

| TR14 |       |
|------|-------|
| SW   |       |
| C    | 1 V   |
| B    | 3 V   |
| E    | 3.7 V |
| Ic   | 2 mA  |

| TR15 |        |
|------|--------|
| SW   |        |
| C    | 0 V    |
| B    | 0 V    |
| E    | 0.6 V  |
| Ic   | 0.5 mA |

| TR16 |        |
|------|--------|
| SW   |        |
| C    | 0 V    |
| B    | 0 V    |
| E    | 0.6 V  |
| Ic   | 0.5 mA |

| TR19 |  |
|------|--|
| C    |  |
| B    |  |
| E    |  |
| Ic   |  |

| TR20   |        |
|--------|--------|
| BFO-ON |        |
| C      | 0 V    |
| B      | 2.85 V |
| E      | 3.25 V |
| Ic     | 1.9 mA |

| TR21 |         |
|------|---------|
| C    | 1.8 V   |
| B    | 4.9 V   |
| E    | 0.2 V   |
| Ic   | 0.42 mA |

| TR24 |       |
|------|-------|
| C    | 6 V   |
| B    | 4.9 V |
| E    | 4.2 V |
| Ic   | 20 mA |

| TR25 |        |
|------|--------|
| SW   | CAL-ON |
| C    | 0 V    |
| B    | 0 V    |
| E    | 0 V    |
| Ic   | 0 mA   |

| TR27 |        |
|------|--------|
| SW   | CAL-ON |
| C    | 2.3 V  |
| B    | 0 V    |
| E    | 0 V    |
| Ic   | 0 mA   |

| TR28 |         |
|------|---------|
| C    | 2.2 V   |
| B    | 0.5 V   |
| E    | 0.1 V   |
| Ic   | 0.45 mA |

| TR29 |         |
|------|---------|
| C    | 0.4 V   |
| B    | 0 V     |
| E    | 0.6 V   |
| Ic   | 0.75 mA |

| IC1 |        |
|-----|--------|
| FM  |        |
| 2   | 0.7 V  |
| 3   | 0 V    |
| 4   | 1.7 V  |
| 5   | 2.2 V  |
| 6   | 3.3 V  |
| 7   | 3.25 V |
| 8   | 2.2 V  |
| 15  | 4.1 V  |
| 16  | 0.7 V  |

| IC2 |       |
|-----|-------|
| 1   | 0 V   |
| 2   | 6 V   |
| 3   | 1.3 V |
| 4   | 0 V   |
| 5   | 1.3 V |
| 6   | 6 V   |

| D37-51,42 |         |
|-----------|---------|
| Anode     | Cathode |

| D8-12,40,41 |         |
|-------------|---------|
| Anode       | Cathode |

| D6,7  |         |
|-------|---------|
| Anode | Cathode |

| D1-5,13-15,17 |         |
|---------------|---------|
| Anode         | Cathode |

| D37-51,42 |         |
|-----------|---------|
| Anode     | Cathode |

| D8-12,40,41 |         |
|-------------|---------|
| Anode       | Cathode |

| D6,7  |         |
|-------|---------|
| Anode | Cathode |

| D1-5,13-15,17 |         |
|---------------|---------|
| Anode         | Cathode |

## BLOCK DIAGRAM

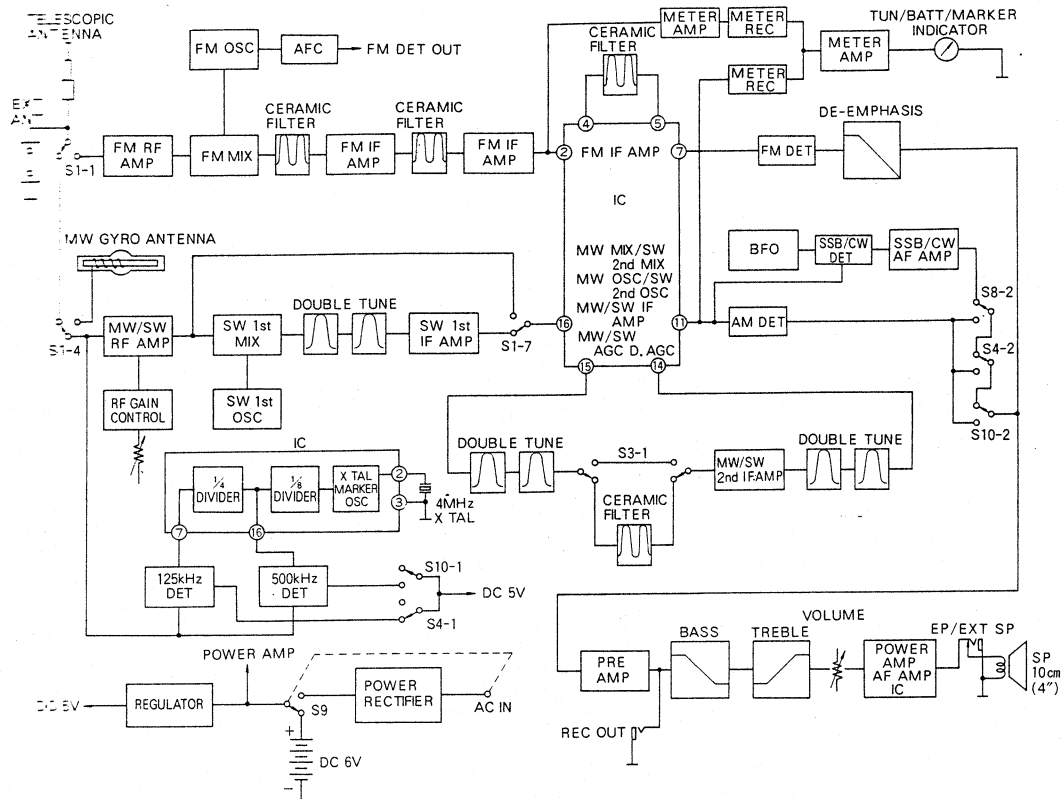


Fig. 20

## ALIGNMENT POINTS

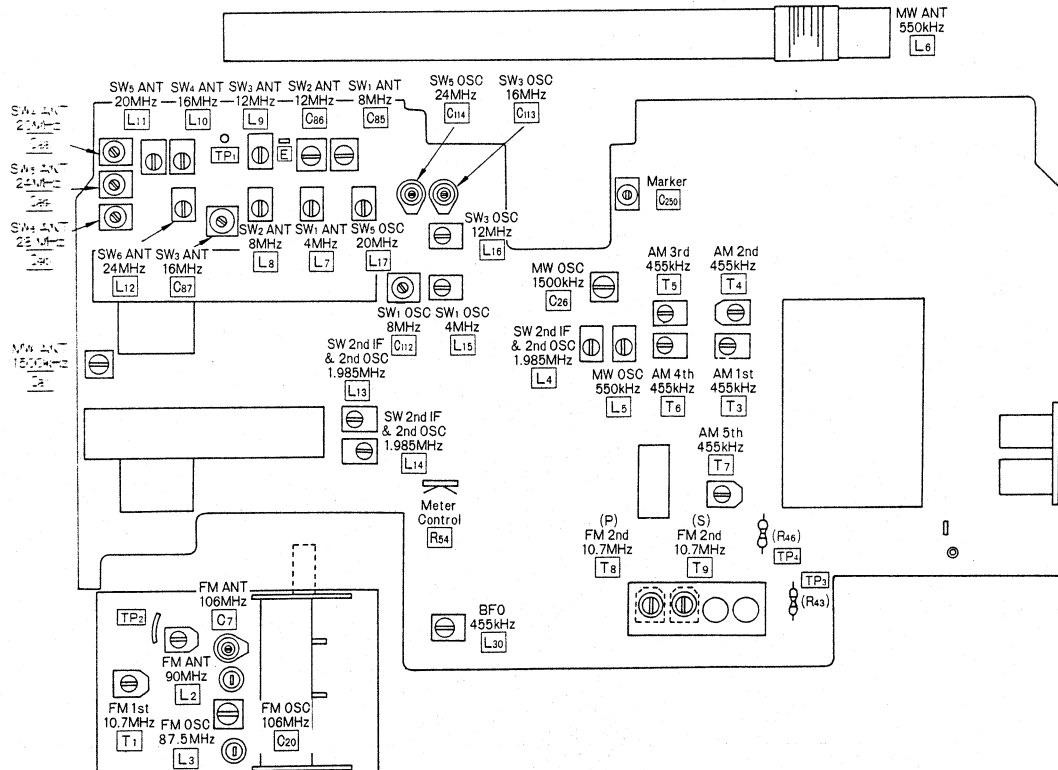


Fig. 21

## TUNING/BATTERY/MARKER METER ADJUSTMENT

### 1. RADIO RECEIVER SETTING

- Set band switch to MW.
- Set volume control to MIN.
- Set power source voltage to DC 6V.

### 2. REMARKS

- Adjust R54 so that the pointer of level meter stays as shown in fig. 22.

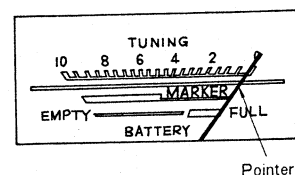


Fig. 22

## ■ ALIGNMENT INSTRUCTIONS

### READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

1. Set volume control to maximum.
2. Set power switch to ON.
3. Set bass and treble control to maximum.
4. Set band switch to MW, SW or FM.
5. Set SW band switch to SW<sub>1</sub>, SW<sub>2</sub>, SW<sub>3</sub>, SW<sub>4</sub>, SW<sub>5</sub> or SW<sub>6</sub>.
6. Set MW/SW RF gain control to high.
7. Set power source voltage to DC 6V.
8. Set FM AFC/Band width switch to narrow, OFF position for the BFO and FM adjustment, and to wide ON position for other adjustment.
9. Set X-TAL Marker switch to OFF.
10. Set BFO switch to ON position for BFO adjustment, and to OFF position for other adjustment.
11. Output of signal generator should be no higher than necessary to obtain an output reading.

## ■ MW, SW ALIGNMENT

| BAND                            | SIGNAL GENERATOR or SWEEP GENERATOR |                                                                                           | RADIO DIAL SETTING               | INDICATOR (VTVM or SCOPE)     | ADJUSTMENT                      | REMARKS                                                                                                                                                                                                                                                                                                |
|---------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------|----------------------------------|-------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | CONNECTIONS                         | FREQUENCY                                                                                 |                                  |                               |                                 |                                                                                                                                                                                                                                                                                                        |
| AM-IF ALIGNMENT                 |                                     |                                                                                           |                                  |                               |                                 |                                                                                                                                                                                                                                                                                                        |
| (1)                             | MW                                  | Fashion loop of several turns of wire and radiate signal into loop of receiver.           | 455 kHz<br>30% Mod.<br>at 400 Hz | Point of non-interference.    | Output meter across voice coil. | T <sub>3</sub> (AM 1st IFT)<br>T <sub>4</sub> (AM 2nd IFT)<br>T <sub>5</sub> (AM 3rd IFT)<br>T <sub>6</sub> (AM 4th IFT)<br>T <sub>7</sub> (AM 5th IFT)<br><br>1. Set band width switch to narrow and adjust for maximum output.<br>2. Set band width switch to wide.<br>3. Adjust for maximum output. |
| BFO ALIGNMENT                   |                                     |                                                                                           |                                  |                               |                                 |                                                                                                                                                                                                                                                                                                        |
| (2)                             | MW                                  | "                                                                                         | 455 kHz                          | "                             | Audio output from speaker.      | L <sub>30</sub> (BFO OSC Coil)<br><br>Adjust for zero beat.                                                                                                                                                                                                                                            |
| MW-RF ALIGNMENT                 |                                     |                                                                                           |                                  |                               |                                 |                                                                                                                                                                                                                                                                                                        |
| (3)                             | MW                                  | "                                                                                         | 550 kHz                          | 550 kHz<br>(Refer to fig.29)  | Output meter across voice coil  | L <sub>5</sub> (MW OSC Coil)<br>L <sub>6</sub> (MW ANT Coil)<br><br>Adjust for maximum output.                                                                                                                                                                                                         |
| (4)                             | MW                                  | "                                                                                         | 1500 kHz                         | 1500 kHz<br>(Refer to fig.30) | "                               | C <sub>26</sub> (MW OSC Trimmer)<br>C <sub>81</sub> (MW ANT Trimmer)<br><br>Adjust for maximum output.<br>Repeat steps (3) and (4).                                                                                                                                                                    |
| SW-1st IF and 2nd OSC ALIGNMENT |                                     |                                                                                           |                                  |                               |                                 |                                                                                                                                                                                                                                                                                                        |
| (5)                             | SW1                                 | Connect to test point [TP] through ceramic capacitor (10PF).<br>Negative side to point[E] | 1.985 MHz                        | Point of non-interference.    | "                               | L <sub>4</sub> (2nd OSC Coil)<br>L <sub>13</sub> (SW 1st IF Coil)<br>L <sub>14</sub> (SW 1st IF Coil)<br><br>Adjust for maximum output.                                                                                                                                                                |

## ■ PADDING ALIGNMENT

• When you change variable capacitor please adjust as follows.

1. Solder padding capacitors at the position, as shown in fig. 25 according to the following table.

| Ref. No.                            | Part No.    | Description                 |
|-------------------------------------|-------------|-----------------------------|
| C <sub>117</sub> (SW <sub>1</sub> ) | ECQS05122JZ | 1200 PF, 50 WV, ±5%, Styrol |
| C <sub>210</sub> (SW <sub>3</sub> ) | ECMS05270JH | 27 PF, 50WV, ±5%, Mica      |
| C <sub>211</sub> (SW <sub>5</sub> ) | ECCD1H100KC | 10 PF, 50WV, ±10%, Ceramic  |

2. Adjust the RF circuit of SW<sub>1</sub>, SW<sub>3</sub> and SW<sub>5</sub>.

3. Set 125 marker switch to ON position and then check zero beat as following frequencies.

| Band            | Zero Beat Frequency | Radio Dial Setting                                                   |
|-----------------|---------------------|----------------------------------------------------------------------|
| SW <sub>1</sub> | 6 MHz               | Turn spread dial two times from 4 MHz position and set it to 0 kHz.  |
| SW <sub>3</sub> | 14 MHz              | Turn spread dial two times from 12 MHz position and set it to 0 kHz. |
| SW <sub>5</sub> | 22 MHz              | Turn spread dial two times from 20 MHz position and set it to 0 kHz. |

4. If there is difference between spread dial indication and the frequency of following table, please change proper capacitor.

| Band            | Ref. No.         | Spread Dial       | Part No.    | Description                 |
|-----------------|------------------|-------------------|-------------|-----------------------------|
| SW <sub>1</sub> | C <sub>117</sub> | less than 960 kHz | ECQS05821JZ | 820 PF, 50WV, ±5% Styrol    |
|                 |                  | 960~980 kHz       | ECQS05102JZ | 1000PF, 50WV, ±5%, Styrol   |
|                 |                  | 20~40 kHz         | ECMS05152JZ | 1500PF, 50WV, ±5%, Mica     |
|                 |                  | more than 40 kHz  | ECQS05182JZ | 1800PF, 50WV, ±5%, Styrol   |
| SW <sub>3</sub> | C <sub>210</sub> | less than 960 kHz | ECCE1H100KC | 10PF, 50WV, ±10%, Ceramic   |
|                 |                  | 960~980 kHz       | ECMS05220JH | 22PF, 50WV, ±5%, Mica       |
|                 |                  | 20~40 kHz         | ECMS05330JH | 33PF, 50WV, ±5%, Mica       |
|                 |                  | more than 40 kHz  | ECMS05470JH | 47PF, 50WV, ±5%, Mica       |
| SW <sub>5</sub> | C <sub>211</sub> | less than 920 kHz | ECCD1H040C  | 4PF, 50WV, ±0.25PF, Ceramic |
|                 |                  | 920~960 kHz       | ECCD1H070DC | 7PF, 50WV, ±0.5PF, Ceramic  |
|                 |                  | 40~80 kHz         | ECMS05150JH | 15PF, 50WV, ±5%, Mica       |
|                 |                  | more than 80 kHz  | ECMS05180JH | 18PF, 50WV, ±5%, Mica       |

## SW RF ALIGNMENT

| SW1-RF ALIGNMENT |                                     |                                                                                         |                    |                            |                                    |                                                                         |                                                           |
|------------------|-------------------------------------|-----------------------------------------------------------------------------------------|--------------------|----------------------------|------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------|
| BAND             | SIGNAL GENERATOR or SWEEP GENERATOR |                                                                                         | RADIO DIAL SETTING | INDICATOR (VTVM or SCOPE)  | ADJUSTMENT                         | REMARKS                                                                 |                                                           |
|                  | CONNECTIONS                         | FREQUENCY                                                                               |                    |                            |                                    |                                                                         |                                                           |
| SW1-RF ALIGNMENT |                                     |                                                                                         |                    |                            |                                    |                                                                         |                                                           |
| (1)              | SW1                                 | Connect to test point [TP] through ceramic capacitor (10PF). Negative side to point [E] | 4 MHz              | 4 MHz<br>Refer to note 1.  | Output meter<br>across voice coil. | L <sub>15</sub> (SW1 OSC Coil)<br>L <sub>7</sub> (SW1 ANT Coil)         | Adjust for maximum output.                                |
| (2)              | SW1                                 | "                                                                                       | 8 MHz              | 8 MHz<br>Refer to note 2.  | "                                  | C <sub>112</sub> (SW1 OSC Trimmer)<br>C <sub>85</sub> (SW1 ANT Trimmer) | Adjust for maximum output.<br>Repeat steps (1) and (2).   |
| SW2-RF ALIGNMENT |                                     |                                                                                         |                    |                            |                                    |                                                                         |                                                           |
| (3)              | SW2                                 | "                                                                                       | 8 MHz              | 8 MHz<br>Refer to note 1.  | "                                  | L <sub>8</sub> (SW2 ANT Coil)                                           | Adjust for maximum output.                                |
| (4)              | SW2                                 | "                                                                                       | 12 MHz             | 12 MHz<br>Refer to note 2. | "                                  | C <sub>86</sub> (SW2 ANT Trimmer)                                       | Adjust for maximum output.<br>Repeat steps (3) and (4).   |
| SW3-RF ALIGNMENT |                                     |                                                                                         |                    |                            |                                    |                                                                         |                                                           |
| (5)              | SW3                                 | "                                                                                       | 12 MHz             | 12 MHz<br>Refer to note 1. | "                                  | L <sub>16</sub> (SW3 OSC Coil)<br>L <sub>9</sub> (SW3 ANT Coil)         | Adjust for maximum output.                                |
| (6)              | SW3                                 | "                                                                                       | 16 MHz             | 16 MHz<br>Refer to note 2. | "                                  | C <sub>113</sub> (SW3 OSC Trimmer)<br>C <sub>87</sub> (SW3 ANT Trimmer) | Adjust for maximum output.<br>Repeat steps (5) and (6).   |
| SW4-RF ALIGNMENT |                                     |                                                                                         |                    |                            |                                    |                                                                         |                                                           |
| (7)              | SW4                                 | "                                                                                       | 16 MHz             | 16 MHz<br>Refer to note 1. | "                                  | L <sub>10</sub> (SW4 ANT Coil)                                          | Adjust for maximum output.                                |
| (8)              | SW4                                 | "                                                                                       | 20 MHz             | 20 MHz<br>Refer to note 2. | "                                  | C <sub>88</sub> (SW4 ANT Trimmer)                                       | Adjust for maximum output.<br>Repeat steps (7) and (8).   |
| SW5-RF ALIGNMENT |                                     |                                                                                         |                    |                            |                                    |                                                                         |                                                           |
| (9)              | SW5                                 | "                                                                                       | 20 MHz             | 20 MHz<br>Refer to note 1. | "                                  | L <sub>17</sub> (SW5 OSC Coil)<br>L <sub>11</sub> (SW5 ANT Coil)        | Adjust for maximum output.                                |
| (10)             | SW5                                 | "                                                                                       | 24 MHz             | 24 MHz<br>Refer to note 2. | "                                  | C <sub>114</sub> (SW6 OSC Trimmer)<br>C <sub>89</sub> (SW5 ANT Trimmer) | Adjust for maximum output.<br>Repeat steps (9) and (10).  |
| SW6-RF ALIGNMENT |                                     |                                                                                         |                    |                            |                                    |                                                                         |                                                           |
| (11)             | SW6                                 | "                                                                                       | 24 MHz             | 24 MHz<br>Refer to note 1. | "                                  | L <sub>12</sub> (SW6 ANT Coil)                                          | Adjust for maximum output.                                |
| (12)             | SW6                                 | "                                                                                       | 28 MHz             | 28 MHz<br>Refer to note 2. | "                                  | C <sub>90</sub> (SW6 ANT Trimmer)                                       | Adjust for maximum output.<br>Repeat steps (11) and (12). |

### Notes:

1. Set tuning capacitor to maximum capacity (minimum frequency), tuning knob to fully counter-clockwise, spread dial to 435 kHz, as shown in fig. 23. Then set tuning knob to clockwise and set spread dial to 0 kHz, as shown in fig. 24.

2. Set spread dial to 0 kHz by turning 4 times to clockwise from the position of note 1.

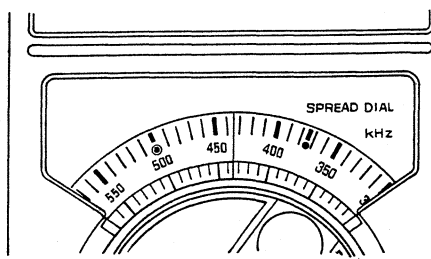


Fig. 23

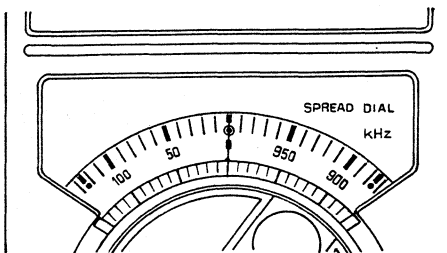


Fig. 24

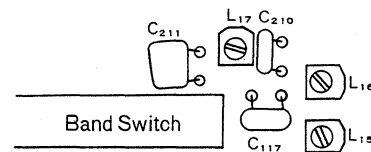


Fig. 25

## MARKER ALIGNMENT

1. Set trimmer capacitor (C<sub>250</sub>) to maximum capacity.
2. Check zero beat at the position of 24 MHz (SW<sub>5</sub>).
3. Set 125, 500 kHz marker to ON. For the image beat of 24.03 MHz, set spread dial to 24.03 MHz and adjust C<sub>250</sub> so that the meter indicates 4 scale or less.

## FM ALIGNMENT INSTRUCTIONS

| SIGNAL GENERATOR or SWEEP GENERATOR                                                                                          |                         | RADIO DIAL SETTING                            | INDICATOR (VTVM or SCOPE)                                                                       | ADJUSTMENT                                                           | REMARKS                                              |
|------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|
| CONNECTIONS                                                                                                                  | FREQUENCY               |                                               |                                                                                                 |                                                                      |                                                      |
| FM-IF ALIGNMENT                                                                                                              |                         |                                               |                                                                                                 |                                                                      |                                                      |
| High side thru. 0.001 $\mu$ F to point <b>TP</b> <sub>2</sub> . Negative side to point <b>E</b> .                            | 10.7 MHz (400 kHz SWP.) | Point of non-interference. (on/about 90 MHz). | Connect vert. amp. of scope to point <b>TP</b> <sub>3</sub> . Negative side to point <b>E</b> . | T <sub>1</sub> (FM 1st IFT)<br>T <sub>8</sub> (FM 2nd IFT) (Primary) | Adjust for maximum amplitude. (Refer to fig. 26).    |
| "                                                                                                                            | "                       | "                                             | "                                                                                               | T <sub>9</sub> (FM 2nd IFT) (Secondary)                              | Adjust for maximum amplitude. (Refer to fig. 27).    |
| FM-RF ALIGNMENT                                                                                                              |                         |                                               |                                                                                                 |                                                                      |                                                      |
| Connect to test point <b>TP</b> <sub>1</sub> through FM dummy antenna. Negative side to point <b>E</b> . (Refer to fig. 28). | 87.5 MHz                | Variable capacitor fully closed.              | Output meter across voice coil.                                                                 | L <sub>3</sub> (FM OSC Coil)                                         | Adjust for maximum output.                           |
| "                                                                                                                            | 90 MHz                  | 90 MHz (Refer to fig. 31)                     | "                                                                                               | L <sub>2</sub> (FM Tuning Coil)                                      | Adjust for maximum output.                           |
| "                                                                                                                            | 106 MHz                 | 106 MHz (Refer to fig. 32)                    | "                                                                                               | C <sub>20</sub> (FM OSC Trimmer)<br>C <sub>7</sub> (FM ANT Trimmer)  | Adjust for maximum output. Repeat steps (3) and (4). |

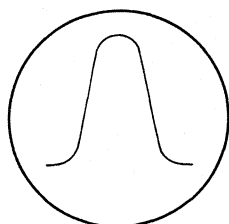


Fig. 26

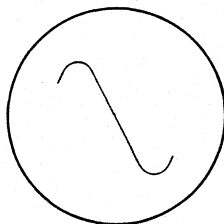


Fig. 27

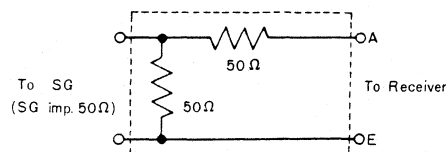


Fig. 28 FM Dummy Antenna

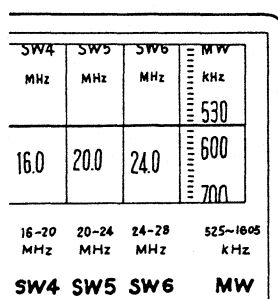
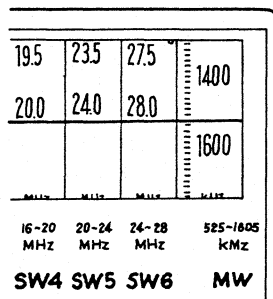


Fig. 29 550 kHz



(MW) Fig. 30 1500 kHz

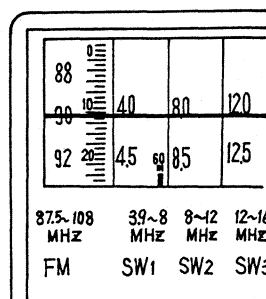


Fig. 31 90 MHz (FM)

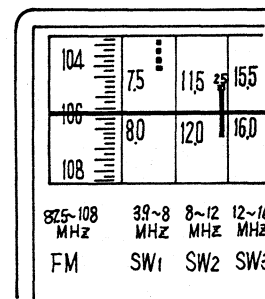
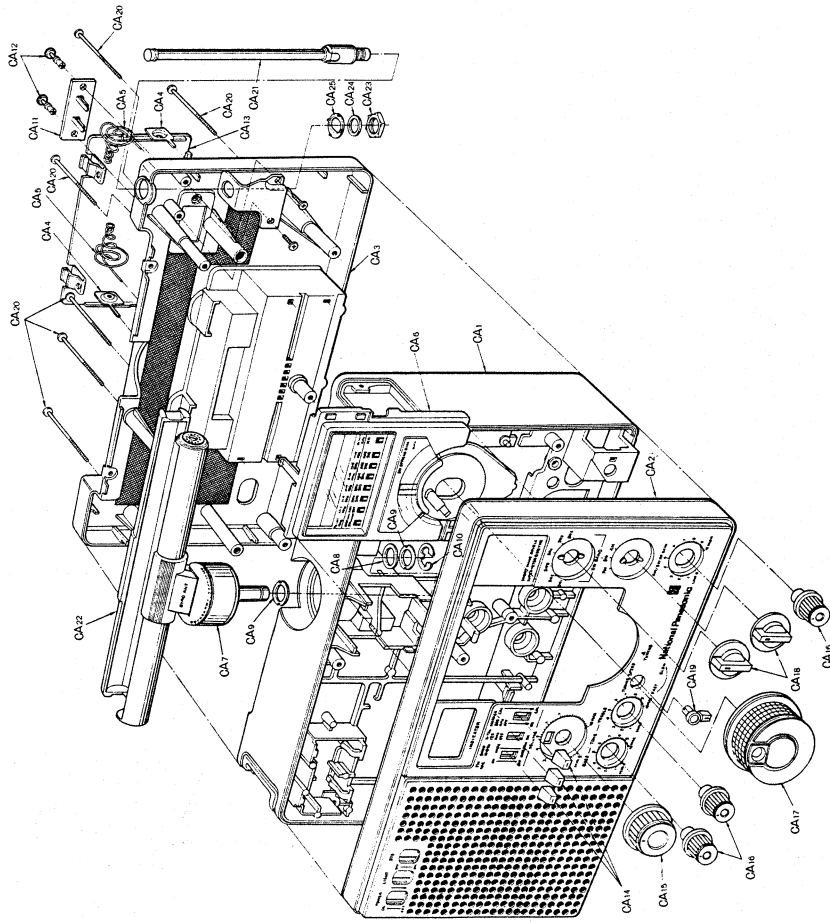


Fig. 32 106 MHz

## ■ CABINET PARTS LOCATION



## ■ CHASSIS PARTS LOCATIONS

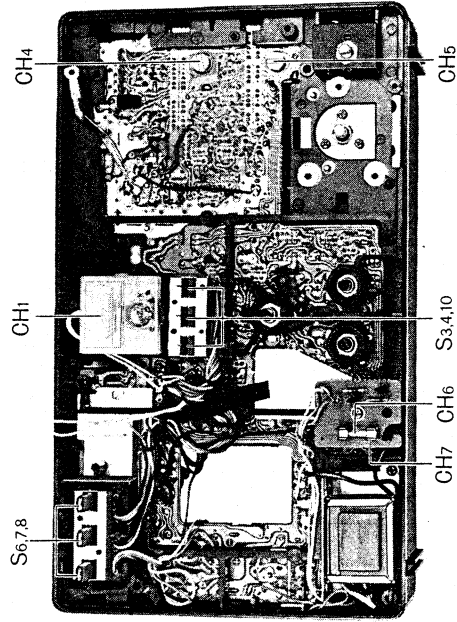


Fig. 36

## ■ PACKING MATERIALS AND ACCESSORIES

Fig. 33

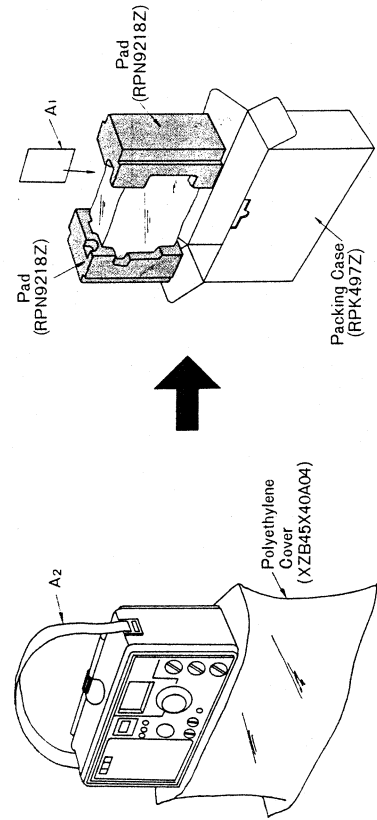


Fig. 34

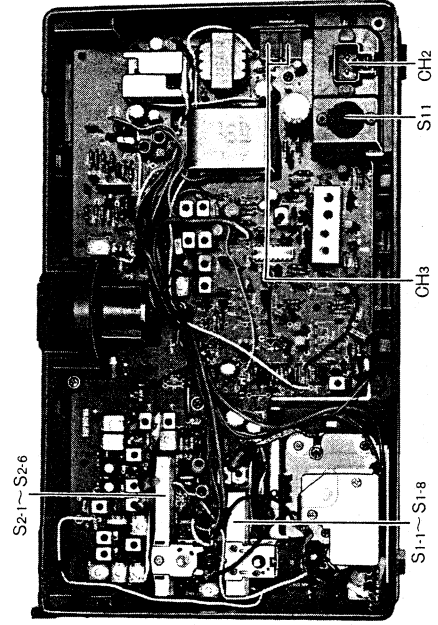


Fig. 37

# ■ DIAL DRIVE ASSEMBLY PARTS LOCATIONS

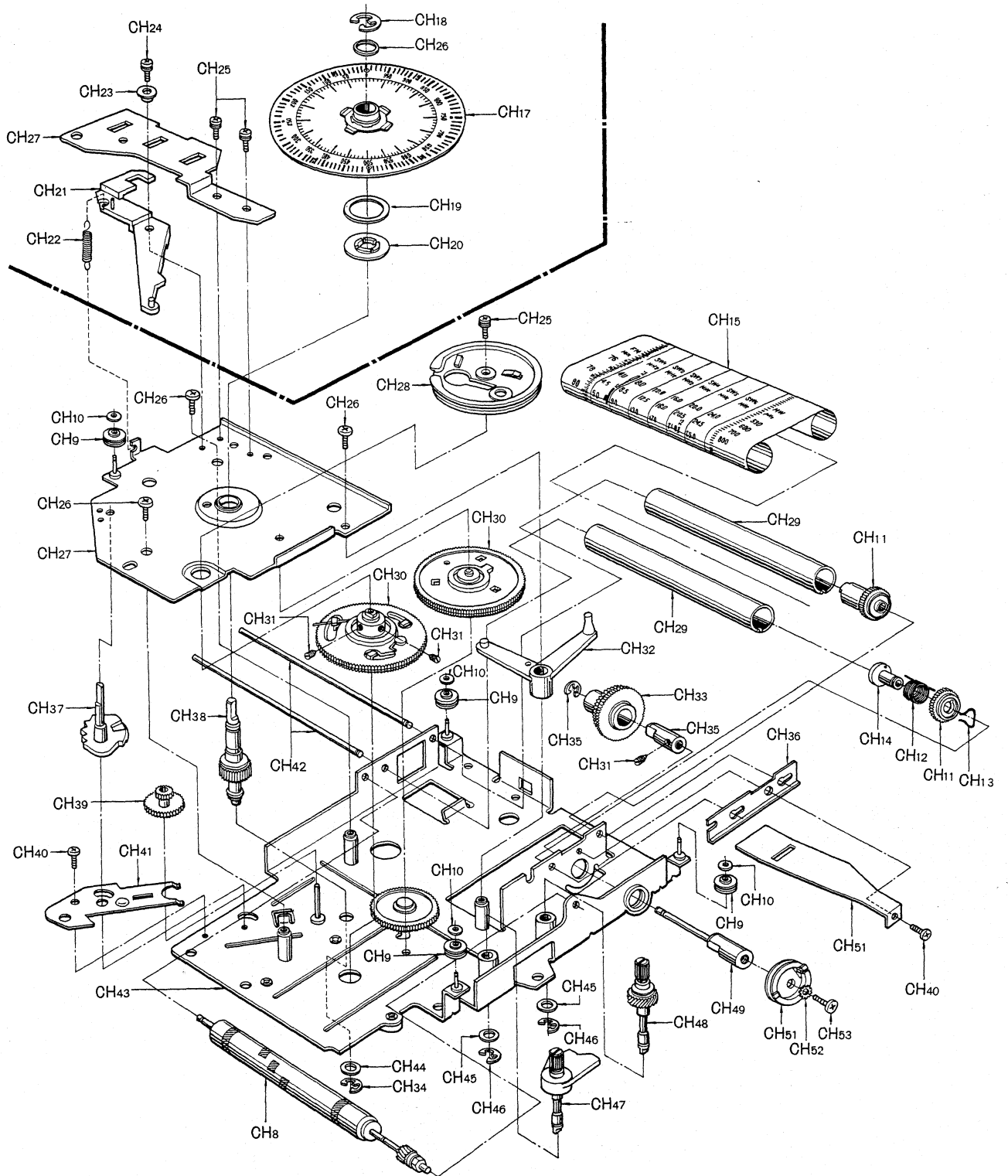


Fig. 38

| Ref. No.                                          | Part No.   | Part Name & Description                       | Per Set | Remarks |
|---------------------------------------------------|------------|-----------------------------------------------|---------|---------|
| <b>SPEAKER</b>                                    |            |                                               |         |         |
| SP                                                | EAS10P57SA | Speaker, Imp.8Ω, PM Dynamic                   | 1       | X       |
| <b>SWITCHES</b>                                   |            |                                               |         |         |
| S1-1~S1-8                                         | RSR3H02Z-H | Switch, Band                                  | 1       | X       |
| S2-1~S2-6                                         | RSR6F01Z-P | Switch, SW Band                               | 1       | X       |
| S3,4,10                                           | RSTX003Z-A | Switch, FM AFC, X-TAL MARKER                  | 1       | X       |
| S6,7,8                                            | RSTX002Z-M | Switch, Power, Light, BFO                     | 1       | X       |
| S11                                               | RSR2A01Z-H | Switch, Voltage Selector                      | 1       | X       |
| <b>RESISTORS</b>                                  |            |                                               |         |         |
| R27,67,69,71,116,121,601                          | ERD25TJ221 | 220Ω, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 7       | Z       |
| R11,17,22,33,36,65,72,88,93,132                   | ERD25TJ471 | 470Ω, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 10      | Z       |
| R49,61,600                                        | ERD25TJ681 | 680Ω, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 3       | Z       |
| R14,15,26,120                                     | ERD25TJ101 | 100Ω, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 4       | Z       |
| R9,10,40,41,44,87,94,95,96,99,102,104,137,171,172 | ERD25TJ102 | 1KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon   | 15      | Z       |
| R3,4,7,23,28,29,62,68,122,135,602,603,604,605     | ERD25TJ472 | 4.7KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon | 14      | Z       |
| R8,16,21,46,114,139                               | ERD25TJ103 | 10KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 6       | Z       |
| R130,131                                          | ERD25TJ153 | 15KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 2       | Z       |
| R1,130,131                                        | ERD25TJ223 | 22KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 3       | Z       |
| R31,35                                            | ERD25TJ473 | 47KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 2       | Z       |
| R107,136                                          | ERD25TJ100 | 10Ω, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon   | 2       | Z       |
| R5,57,144                                         | ERD25TJ220 | 22Ω, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon   | 3       | Z       |
| R34                                               | ERD25TJ470 | 47Ω, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon   | 1       | Z       |
| R25                                               | ERD25TJ680 | 68Ω, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon   | 1       | Z       |
| R12,134                                           | ERD25TJ151 | 150Ω, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 2       | Z       |
| R32,73                                            | ERD25TJ331 | 330Ω, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 2       | Z       |
| R18,30,38,89,100,106,138,170                      | ERD25TJ222 | 2.2KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon | 8       | Z       |
| R37                                               | ERD25TJ272 | 2.7KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon | 1       | Z       |
| R92,97,117,612                                    | ERD25TJ332 | 3.3KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon | 4       | Z       |
| R6,63,118                                         | ERD25TJ682 | 6.8KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon | 3       | Z       |
| R129                                              | ERD25TJ683 | 68KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 1       | Z       |
| R39                                               | ERD25TJ123 | 12KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 1       | Z       |
| R52                                               | ERD25TJ154 | 150KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon | 1       | Z       |
| R2,13,51                                          | ERD25TJ104 | 100KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon | 3       | Z       |
| R91                                               | ERD25TJ334 | 330KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon | 1       | Z       |
| R43                                               | ERD25TJ474 | 470KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon | 1       | Z       |
| R115                                              | ERD25TJ684 | 680KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon | 1       | Z       |

| Ref. No.                               | Part No.    | Part Name & Description                       | Per Set | Remarks |
|----------------------------------------|-------------|-----------------------------------------------|---------|---------|
| R60                                    | ERD25TJ105  | 1MΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon   | 1       | Z       |
| R105                                   | ERX1ANJR47U | 0.47Ω, 1Watt, $\pm 5\%$ , Metal Oxide         | 1       | Z       |
| R133                                   | ERD25TJ681  | 680Ω, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon  | 1       | Z       |
| R611                                   | ERD25TJ182  | 1.8KΩ, $\frac{1}{2}$ Watt, $\pm 5\%$ , Carbon | 1       | Z       |
| <b>CAPACITORS</b>                      |             |                                               |         |         |
| C15                                    | ECCD1H1R5C  | 1.5PF, 50WV, $\pm 0.25$ PF, Ceramic           | 1       | Z       |
| C84                                    | ECCD1H020C  | 2PF, 50WV, $\pm 0.25$ PF, Ceramic             | 1       | Z       |
| C13,214                                | ECCD1H030C  | 3PF, 50WV, $\pm 0.25$ PF, Ceramic             | 2       | Z       |
| C124,211                               | ECCD1H040C  | 4PF, 50WV, $\pm 0.25$ PF, Ceramic             | 2       | Z       |
| C27,39                                 | ECCD1H050CC | 5PF, 50WV, $\pm 0.25$ PF, Ceramic             | 2       | Z       |
| C8,21,49,94,102,217,507                | ECCD1H070DC | 7PF, 50WV, $\pm 0.5$ PF, Ceramic              | 7       | Z       |
| C1,103,110,195,213,500                 | ECCD1H100KC | 10PF, 50WV, $\pm 10\%$ , Ceramic              | 6       | Z       |
| C10,222                                | ECCD1H150KC | 15PF, 50WV, $\pm 10\%$ , Ceramic              | 2       | Z       |
| C105                                   | ECCD1H180KC | 18PF, 50WV, $\pm 10\%$ , Ceramic              | 1       | Z       |
| C9,152,605                             | ECCD1H270KC | 27PF, 50WV, $\pm 10\%$ , Ceramic              | 3       | Z       |
| C37,55,608                             | ECCD1H470KC | 47PF, 50WV, $\pm 10\%$ , Ceramic              | 3       | Z       |
| C38                                    | ECKD1H102ZF | 0.001μF, 50WV, $\pm 28\%$ , Ceramic           | 1       | Z       |
| C210,223,502                           | ECCD1H101K  | 100PF, 50WV, $\pm 10\%$ , Ceramic             | 5       | Z       |
| 503,606                                |             |                                               |         |         |
| C43,205                                | ECCD1H181K  | 180PF, 50WV, $\pm 10\%$ , Ceramic             | 2       | Z       |
| C140                                   | ECKV1H331KB | 330PF, 50WV, $\pm 10\%$ , Ceramic             | 1       | Z       |
| C122                                   | ECCD1H390JU | 39PF, 50WV, $\pm 5\%$ , Ceramic               | 1       | Z       |
| C11,14,17,107,225,510,511              | ECKV1H103ZF | 0.01μF, 50WV, $\pm 28\%$ , Ceramic            | 7       | Z       |
| C31,34,36,226                          | ECKT1H103ZF | 0.01μF, 50WV, $\pm 28\%$ , Ceramic            | 4       | Z       |
| C18,23,32,45,68,127                    | ECKV1H223ZF | 0.022μF, 50WV, $\pm 28\%$ , Ceramic           | 6       | Z       |
| C3,28,50,58,63,70,106,129,604,607      | ECKT1H223ZF | 0.022μF, 50WV, $\pm 28\%$ , Ceramic           | 9       | Z       |
| C128                                   | ECKD1H471MD | 470PF, 50WV, $\pm 20\%$ , Ceramic             | 1       | Z       |
| C12,163                                | ECKD1H102MD | 0.001μF, 50WV, $\pm 20\%$ , Ceramic           | 2       | Z       |
| C11,154,165,166,164,221                | ECKD1H222MD | 0.0022μF, 50WV, $\pm 20\%$ , Ceramic          | 6       | Z       |
| C142                                   | ECKD1H332MD | 0.0033μF, 50WV, $\pm 20\%$ , Ceramic          | 1       | Z       |
| C157                                   | ECKD1H682MD | 0.0068μF, 50WV, $\pm 20\%$ , Ceramic          | 1       | Z       |
| C40,42,109,110,197,198,216,218,219,220 | ECKD1H103MD | 0.01μF, 50WV, $\pm 20\%$ , Ceramic            | 10      | Z       |
| C120                                   | ECMS05270JH | 27PF, 50WV, $\pm 5\%$ , Mica                  | 1       | Z       |
| C121                                   | ECMS05390JH | 39PF, 50WV, $\pm 5\%$ , Mica                  | 1       | Z       |
| C99,100,601                            | ECMS05560JH | 56PF, 50WV, $\pm 5\%$ , Mica                  | 3       | Z       |
| C98                                    | ECMS05820JH | 82PF, 50WV, $\pm 5\%$ , Mica                  | 1       | Z       |
| C97,602                                | ECMS05101JH | 100PF, 50WV, $\pm 5\%$ , Mica                 | 2       | Z       |
| C25,96                                 | ECMS05181JH | 180PF, 50WV, $\pm 5\%$ , Mica                 | 2       | Z       |
| C119                                   | ECMS05820GH | 82PF, 50WV, $\pm 2\%$ , Mica                  | 1       | Z       |
| C118                                   | ECMS05141GH | 140PF, 50WV, $\pm 2\%$ , Mica                 | 1       | Z       |
| C211                                   | ECMS05120JH | 12PF, 50WV, $\pm 5\%$ , Mica                  | 1       | Z       |
| C126                                   | ECQS05102JZ | 1000PF, 50WV, $\pm 5\%$ , Styrol              | 1       | Z       |

# REPLACEMENT PARTS LIST.....Model RF-2200BS(A) (RD7703-1452)

**NOTES:** 1.Part numbers are indicated on most mechanical parts.  
Please use this part number for parts orders.  
2.X-Z rank: X rank parts will cover 80% of repair needs.  
X+Y rank parts will cover 95% of repair needs.  
Z rank parts are less necessary.  
3.Components identified by shaded area have special characteristic important for safety. When replacing any of these components use only manufacturer's special parts.  
4.Part numbers shown in bold letters are service standard parts and may differ from production parts.  
5.The O mark is used by the manufacturing plant only.

| Ref. No.                                           | Part No.         | Part Name & Description                                                           | Per Set | Remarks |
|----------------------------------------------------|------------------|-----------------------------------------------------------------------------------|---------|---------|
| <b>INTEGRATED CIRCUITS, TRANSISTORS AND DIODES</b> |                  |                                                                                   |         |         |
| IC1                                                | RVI $\mu$ PC1018 | IC, FM/AM IF AMP, AM Converter                                                    | 1       | X       |
| IC2                                                | RVIHA1329        | IC, AF & Power Amp.                                                               | 1       | X       |
| IC3                                                | RVM54812         | IC, Marker                                                                        | 1       | OX      |
| TR1                                                | 2SK49            | Transistor(Si), FM RF Amp.                                                        | 1       | X       |
| TR2,3,4,5,11,12,13,14,15,16,19                     | 2SA838           | Transistor(Ge), FM OSC, FM MIX, FM IF AMP, SW MIX, Buffer Amp., SW OSC, Switching | 11      | X       |
| TR6,25                                             | 2SC829           | Transistor(Si), AM IF Amp., Switching                                             | 2       | X       |
| TR8,20,29                                          | 2SA564           | Transistor(Ge), Meter AMP., BFO                                                   | 3       | X       |
| TR9                                                | 2SK104           | Transistor(Si), AM RF AMP.                                                        | 1       | OX      |
| TR10,27                                            | 2SC828           | Transistor(Si), AM RF Gain Control                                                | 2       | X       |
| TR21,24,28,40                                      | 2SC945           | Transistor(Si), AF Amp., Regulator, SSB AF Amp., Switching                        | 4       | X       |
| D1,2,4                                             | RVDSD113         | Diode(Si), FM AGC, Switching                                                      | 3       | X       |
| D3,14                                              | RVD1K110         | Diode(Si), FM AGC, SSB Det.                                                       | 2       | X       |
| D5,13                                              | RVDVD1250M       | Diode(Si), Operation Compensator                                                  | 2       | X       |
| D6,7                                               | 2-OA90           | Diode(Ge), FM Detector                                                            | 2       | X       |
| D8,9,10,11,12,40,41                                | OA90             | Diode(Ge), Detector, AM Meter Rect. Marker                                        | 7       | X       |
| D15                                                | RVDVD1252L       | Diode(Si), Operation Compensator                                                  | 1       | X       |
| D17                                                | RVDMZA205        | Diode(Si), Zener                                                                  | 1       | X       |
| D37,42                                             | MA150            | Diode(Si), Switching                                                              | 2       | X       |
| D38,39,50,51                                       | RVD10E1LF        | Diode(Si), Rectifier                                                              | 4       | X       |
| <b>CRYSTAL AND THERMISTORS</b>                     |                  |                                                                                   |         |         |
| X1                                                 | RVCX4000Q5Z      | Crystal                                                                           | 1       | X       |
| Th1,2                                              | RRT262           | Temperature Compensator                                                           | 2       | X       |
| <b>CERAMIC FILTERS, COILS AND TRANSFORMERS</b>     |                  |                                                                                   |         |         |
| CF1,2,3                                            | RVF107MFR        | Ceramic Filter                                                                    | 3       | X       |
| CF4                                                | RVFBFB455C1      | Ceramic Filter                                                                    | 1       | X       |
| L1                                                 | RLA4Y6           | Antenna Coil, FM                                                                  | 1       | X       |

| Ref. No.                      | Part No.             | Part Name & Description                                                | Per Set | Remarks |
|-------------------------------|----------------------|------------------------------------------------------------------------|---------|---------|
| L2                            | RLD4N33              | Coil, Tuning                                                           | 1       | X       |
| L3                            | RLO4N95              | Oscillator Coil, FM(RLO4N27-O)                                         | 1       | X       |
| L4                            | RLO9M4               | Oscillator Coil, 2nd Local                                             | 1       | X       |
| L5                            | RLO2M16              | Oscillator Coil, MW                                                    | 1       | X       |
| L6                            | RLF2G38              | Antenna Coil, MW                                                       | 1       | X       |
| L7                            | RLA3M19              | Antenna Coil, SW1                                                      | 1       | X       |
| L8                            | RLA3M20              | Antenna Coil, SW2                                                      | 1       | X       |
| L9                            | RLA3M21              | Antenna Coil, SW3                                                      | 1       | X       |
| L10                           | RLA3M22              | Antenna Coil, SW4                                                      | 1       | X       |
| L11                           | RLA3M23              | Antenna Coil, SW5                                                      | 1       | X       |
| L12                           | RLA3M24              | Antenna Coil, SW6                                                      | 1       | X       |
| L13                           | RLI9M3               | IFT, SW 2nd IF                                                         | 1       | X       |
| L14                           | RLI9M4               | IFT, SW 2nd IF                                                         | 1       | X       |
| L15                           | RLO3M37              | Oscillator Coil, SW1                                                   | 1       | X       |
| L16                           | RLO3M38              | Oscillator Coil, SW3                                                   | 1       | X       |
| L17                           | RLO3M39              | Oscillator Coil, SW5,6                                                 | 1       | X       |
| L24                           | RLI4M103             | Coil, IF Trap                                                          | 1       | X       |
| L30                           | RLO9M5               | Oscillator Coil, BFO                                                   | 1       | X       |
| T1                            | RLI4M101             | IFT, FM 1st                                                            | 1       | X       |
| T3,5                          | RLI2M212             | IFT, AM 1st, 3rd(RLI2M212-K)                                           | 2       | X       |
| T4,6                          | RLI2M208             | IFT, AM 2nd, 4th                                                       | 2       | X       |
| T7                            | RLI2M402             | IFT, AM 5th                                                            | 1       | X       |
| T8                            | RLI4M504             | IFT, FM 2nd(Primary)                                                   | 1       | X       |
| T9                            | RLI4M506             | IFT, FM 2nd(Secondary)                                                 | 1       | X       |
| T11                           | RLT2H32              | Output Transformer, P=20 $\Omega$ :S=8 $\Omega$ (RLT2H32-V, RLT2H32-W) | 1       | X       |
| T12                           | RLT5J199             | Power Transformer                                                      | 1       | X       |
| <b>VARIABLE RESISTORS</b>     |                      |                                                                        |         |         |
| R64                           | EVHMA095A14          | 10K $\Omega$ (A), RF Gain Control                                      | 1       | X       |
| R103                          | EVH8XAF25A14         | 10K $\Omega$ (A), Volume Control                                       | 1       | X       |
| R98,101                       | EVH7XAF25B14         | 10K $\Omega$ (B), Tone Control                                         | 2       | X       |
| R54                           | EVLTOAA00B14         | 10K $\Omega$ (B), Pre Set, Meter Control                               | 1       | Y       |
| <b>VARIABLE CAPACITORS</b>    |                      |                                                                        |         |         |
| C6,9,22,80                    | RCVCV45D112          | Tuning Capacitor                                                       | 1       | Y       |
| C85,86                        | RCVCTY21D17          | Trimmer Capacitor                                                      | 1       | Y       |
| C20,26,81,250                 | RCV1PX15AG           | Trimmer Capacitor                                                      | 4       | Y       |
| C87,88,89,90                  | RCV1PX20AG           | Trimmer Capacitor                                                      | 4       | Y       |
| C112,113,114                  | RCV1PX30AG           | Trimmer Capacitor                                                      | 3       | Y       |
| C7                            | ECV1ZW10 $\times$ 32 | Trimmer Capacitor                                                      | 1       | Y       |
| <b>COMPONENT COMBINATIONS</b> |                      |                                                                        |         |         |
| Z1                            | RXABPF10801H         | Component Combination, Coils & Capacitors                              | 1       | Y       |
| Z2                            | EXA5DLO4C            | Component Combination, 330PF $\times$ 3, 4.7K $\Omega$ $\times$ 2      | 1       | Y       |

| Ref. No.                  | Part No.     | Part Name & Description               | Per Set | Remarks |
|---------------------------|--------------|---------------------------------------|---------|---------|
| C95                       | ECQS05122KZ  | 1200PF, 50WV, ±10%, Styrol            | 1       | Z       |
| C212                      | ECQS05392KZ  | 3900PF, 50WV, ±10%, Styrol            | 1       | Z       |
| C178                      | ECQS1151JZ   | 150PF, 50WV, ±5%, Styrol              | 1       | Z       |
| C117                      | ECQS05821JZ  | 820PF, 50WV, ±5%, Styrol              | 1       | Z       |
| C59                       | ECFVD153MD   | 0.015μF, 50WV, ±20%, Semi-Conductor   | 1       | Z       |
| C47,54,56,<br>196,228     | ECFVD223MD   | 0.022μF, 50WV, ±20%, Semi-Conductor   | 5       | Z       |
| C44                       | ECFTD473MD   | 0.047μF, 50WV, ±20%, Semi-Conductor   | 1       | Z       |
| C69                       | ECFVD473MD   | 0.047μF, 50WV, ±20%, Semi-Conductor   | 1       | Z       |
| C48,139,600               | ECFTD223MD   | 0.022μF, 50WV, ±20%, Semi-Conductor   | 3       | Z       |
| C52                       | ECEA16V33    | 33μF, 16WV, Electrolytic              | 1       | Y       |
| C167,215                  | ECEA16V47    | 47μF, 16WV, Electrolytic              | 2       | Y       |
| C51,57,72,<br>179,180,193 | ECEA10V100   | 100μF, 10WV, Electrolytic             | 6       | Y       |
| C208                      | ECEA6V470    | 470μF, 6.3WV, Electrolytic            | 1       | Y       |
| C192                      | ECEA6V220    | 220μF, 6.3WV, Electrolytic            | 1       | Y       |
| C603                      | ECQS05471JZ  | 470PF, 50WV, ±5%, Ceramic             | 1       | Z       |
| C182                      | ECEA10V2200  | 2200μF, 10WV, Electrolytic            | 1       | Y       |
| C53,144,181,<br>203       | ECEA16V10    | 10μF, 16WV, Electrolytic              | 4       | Y       |
| C162                      | ECEA35V4R7B  | 4.7μF, 35WV, Electrolytic             | 1       | Y       |
| C24,60,61                 | ECEA50ZR1E   | 1μF, 50WV, Electrolytic               | 3       | Y       |
| C143,156,158<br>160       | ECEA50ZR22   | 0.22μF, 50WV, Electrolytic            | 4       | Y       |
| C141,168                  | ECEA50V1     | 1μF, 50WV, Electrolytic               | 2       | Y       |
| <b>CABINET</b>            |              |                                       |         |         |
| CA1                       | RYMF2200BSXG | Cabinet Assembly                      | 1       | X       |
| CA2                       | RYF1F2200BSX | Cabinet Cover Assembly (Front)        | 1       | X       |
| CA3                       | RYF2F2200BSA | Cabinet Cover Assembly (Rear)         | 1       | OX      |
| CA4                       | RJC111A      | Terminal, Battery ⊕ Side              | 2       | Y       |
| CA5                       | RJC505Z      | Terminal Spring, Battery ⊖ Side       | 2       | Y       |
| CA6                       | RYPF2200BSXG | Front Panel Assembly                  | 1       | X       |
| CA7                       | RYEF2200N    | Gyro Antenna Case Assembly            | 1       | X       |
| CA8                       | RUS238Z      | Spring, Gyro Antenna                  | 1       | Z       |
| CA9                       | RHE6021Z     | Washer, Gyro Antenna                  | 3       | Z       |
| CA10                      | XUC9FY       | Circlip, Gyro Antenna                 | 1       | Z       |
| CA11                      | RJF1044Z     | Terminal, EXT. Antenna                | 1       | Y       |
| CA12                      | SHRA403      | Latch, EXT. Antenna Terminal M'tg     | 2       | Z       |
| CA13                      | RKK114Z      | Cover, Battery Compartment            | 1       | Y       |
| CA14                      | RBE13Z       | Knob, FM AFC, BAND WIDTH              | 3       | X       |
| CA15                      | RBN379Z      | Knob, Volume                          | 1       | X       |
| CA16                      | RBN381Z      | Knob, Bass, Treble, RF Gain           | 3       | X       |
| CA17                      | RBN380Z      | Knob, Tuning                          | 1       | X       |
| CA18                      | RBS103ZK     | Knob, Band                            | 2       | X       |
| CA19                      | RBS104Z      | Knob, Tuning Speed                    | 1       | X       |
| CA20                      | XTB3+50CFN   | Screw, Cabinet Back Cover M'tg        | 6       | Z       |
| CA21                      | XEART160GDY  | Telescopic Antenna, 7 Steps,<br>963mm | 1       | X       |
| CA22                      | RKE140Z      | Cover, Core Antenna                   | 1       | Y       |

| Ref. No.           | Part No.     | Part Name & Description               | Per Set | Remarks |
|--------------------|--------------|---------------------------------------|---------|---------|
| <b>CHASSIS</b>     |              |                                       |         |         |
|                    | XAMR46T200   | Pilot Lamp, Dial & Meter, 6V,<br>40mA | 2       | X       |
| CH1                | RSM2614Z-K   | Meter, Tune, Battery, Marker          | 1       | X       |
| CH2                | RJJ30Z-H     | Jack, EXT. Power Source               | 1       | Y       |
| CH3                | RJJ80A-C     | Jack, Earphone & Rec. Out             | 1       | Y       |
|                    | RUS279Z      | Spring, Band Switch Shaft             | 2       | Z       |
|                    | RNW423Z      | Washer, Band Switch Shaft             | 2       | Z       |
| CH4                | RHM71Z       | Shaft, SW Band Switch                 | 1       | Z       |
| CH5                | RHM69Z       | Shaft, Band Switch                    | 1       | Z       |
|                    | RJE10Z       | Cover, EXT. Power Source Jack         | 1       | Y       |
| CH6                | XBA2C08TRO   | Fuse, 250V, 800mA                     | 1       | X       |
| CH7                | RJF7A        | Holder, Fuse                          | 2       | X       |
|                    | XTW3+10FR    | Red Screw, P.C. Board M'tg            | 3       | Z       |
|                    | RXEF2200BSXG | Dial Drive Assembly                   | 1       | X       |
| CH8                | RXE6F2200N   | Selector, Drum Assembly               | 1       | X       |
| CH9                | RDR20-3      | Pulley, Dial                          | 4       | Z       |
| CH10               | RNW150-2     | Washer, Dial                          | 4       | Z       |
| CH11               | RDG5649Z     | Gear, Roller                          | 1       | Z       |
| CH12               | RDS5050Z     | Spring, Gear                          | 1       | Z       |
| CH13               | RUS273Z      | Spring, Gear                          | 1       | Z       |
| CH14               | RDE88Z       | Shaft, Gear                           | 1       | Z       |
| CH15               | RKD423Y      | Scale, Dial                           | 1       | Y       |
| CH16 (Fig.9)       | RDZ05Z       | Cord (500m), Dial                     | 1 Roll  | Z       |
| CH17               | RXE11F2200N  | Spread Dial Assembly                  | 1       | X       |
| CH18               | XUC6FW       | Circlip, Spread Dial M'tg             | 1       | Z       |
| CH19               | RUS283Z      | Spring, Spread Dial M'tg              | 1       | Z       |
| CH20               | RDE99Z       | Washer, Tuning Shaft M'tg             | 1       | Z       |
| CH21               | RUB145Z      | Lever, Calibrator                     | 1       | Z       |
| CH22               | RDS3120A     | Spring, Calibrator Lever              | 1       | Z       |
| CH23               | RHM68Z       | Spacer, Calibrator Lever              | 1       | Z       |
| <b>ACCESSORIES</b> |              |                                       |         |         |
|                    | XEH1A1-P     | Magnetic Earphone                     | 1       | Y       |
|                    | RJA20Z-K     | Power Cord, AC                        | 1       | Y       |
| A1                 | RQX6071Z     | Instruction Book                      | 1       | Y       |
| A2                 | RQC9011Z     | Belt                                  | 1       | Y       |